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10/558,352	11/20/2006	Stephan H. Hussman	20294/0203630-US0	6488
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AMRANY, ADI				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/558,352

**Applicant(s)**

HUSSMAN ET AL.

**Examiner**

ADI AMRANY

**Art Unit**

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicants' arguments filed May 13, 2009 have been fully considered but they are not persuasive. Regarding Boys, claim 1 recites "a sensor configured to sense a condition of the load." There is no requirement in the claim that the sensor is actually connected to or directly monitors the load itself. As admitted by applicants, the Boys sensor detects changes in the resonance of the primary circuit (Remarks, page 16, 3<sup>rd</sup> paragraph). When the trolley moves, the state of the load changes, and this change is sensed by detecting a change in the primary circuit. Next, applicants contend that Boys' figure 6 does not show a controller (Remarks, page 17, 1<sup>st</sup> paragraph), but then state that element 613 is test point, whose output is used by "an unillustrated master controller." (Remarks, page 17, 2<sup>nd</sup> paragraph).

Applicants' then argue that "no sensing of the load condition is disclosed" (last line of the 2<sup>nd</sup> paragraph). The sentence immediately preceding that one, however, states that the resonant circuit is adjusted to match shifts in the resonant frequency of the primary circuit. The frequency shift is the load condition.

Regarding Rydval, as discussed above, the claims do not recite direct sensing of the load. Rydval discloses sensing a load condition and tuning/detuning the secondary circuit accordingly.

Regarding Boys II, the capacitor (D) is not the tuning capacitor cited in the art rejection of the claims. The non-final rejection (Nov. 14, 2008) pointed to the capacitor (fig 1, item 202) as the capacitive element of the claims. By activating the switch (203),

the Boys II controller (207) selectively applies power from the inductor (W) to the capacitor (202), thereby tuning/detuning the secondary circuit.

Regarding the §103 rejection in view of Boys (Remarks, pages 19-20), Boys discloses sensing a condition of the load by detecting its affect on the resonant frequency of the primary circuit, as discussed above.

Regarding the art rejection of claims 13-15 and 24-26, applicants have only argued against the art rejection of claim 1. Applicants' arguments (Remarks, pages 20-21) do not include any arguments against the actual rejection of these dependent claims.

### ***Drawings***

2. Replacement figures 1-2, 4-5, 7 and 9-10 were received on May 13, 2009. These drawings are acceptable and will be entered.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 7-8, 16-20, 27-35, 37-43 and 45-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Boys (US 5,898,579), an X reference from applicants' International Search Report.

With respect to claim 1, Boys discloses an inductively coupled power transfer pick-up (fig 5-6; col. 5-7) comprising:

a pick-up resonant circuit (fig 5, all components except for 501; fig 6, items 611-614) comprising a capacitive element (502, 612) and an inductive element (505; 611) adapted to receive power from a magnetic field associated with a primary conductive path (501; 601) to supply a load;

a sensor (613) configured to sense a condition of the load; and

a controller (510; col. 6, lines 14-18) configured to selectively tune or de-tune the pick-up resonant circuit in response to the load sensed by the sensor by varying the effective capacitance of the capacitive element of the pick-up resonant circuit to control the transfer of power to the pick-up resonant circuit dependent on the sensed load condition (col. 2, lines 10-19; col. 3, lines 19-35; col. 5, lines 49-47; col. 6, lines 24-29).

With respect to claim 2, Boys discloses the controller comprising a reactive element (502; 612) and a switching device (504; 614) configured to allow the reactive element to be selectively electrically connected to the pick-up circuit.

With respect to claim 3, Boys discloses the apparent capacitance of the reactive element is varied to tune or detune the pick-up resonant circuit (col. 6, line 14-18).

With respect to claim 4, Boys disclose the sensor senses the power required by the load (col. 6, lines 18-22).

With respect to claim 5, Boys discloses a phase device (col. 4, line 65 to col. 5, line 5) configured to sense the phase of voltage/current in the pick-up resonant circuit; and whereby the controller actuates the switching device dependent on the sensed phase.

With respect to claims 7-8 and 18-19, Boys discloses a frequency sensing device (510) configured to sense the frequency of the pick-up resonant circuit whereby the controller actuates the switching device dependent on the sensed frequency.

With respect to claim 16, Boys discloses the inductor comprises the pick-up coil (fig 5-6).

With respect to claim 17, Boys discloses the reactive element is a capacitor (fig 5-6); the phase sensing device senses a voltage in the pick-up resonant circuit (col. 4, line 65 to col. 5, line 5); and the controller is operable to switch the switching device in a predetermined time period after a sensed voltage zero crossing (inherent).

With respect to claim 20, it is inherent that any controller action occurs a "predetermined time" after a sensed event.

With respect to claim 27, Boys discloses the variable reactance is the tuning capacitor.

With respect to claim 28, Boys discloses the ICPT, as discussed above in the rejection of claim 1, and further discloses a power supply comprising a resonant converter to provide alternating current to a primary conductive path (fig 6; 601-610; col. 6, lines 5-29).

With respect to claim 29, Boys discloses the primary conductive path comprises one or more turns of electrically conductive material (610).

With respect to claim 31, there is a greater magnetic field at the location of inductor 610 than in the rest of the primary path.

With respect to claim 32, it is inherent that Boys discloses one or more lumped inductances or one or more distributed inductances, since these limitations comprise all possible configurations for inductances.

With respect to claims 33-34, Boys discloses the primary path and the pick-up resonant circuit comprise amorphous magnetic material (601, 611).

With respect to claim 35, Boys discloses the pick-up resonant circuit is battery free. The battery is part of the primary conductive path.

With respect to claims 37-43 and 45-46, Boys discloses the apparatus necessary to complete the recited methods, as discussed above in the rejections of claims 1-5 and 7-8.

5. Claims 1-4, 28 and 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Rydval (US 5,892,300).

With respect to claims 1, 28 and 37, Rydval discloses an inductively coupled power transfer pick-up (fig 1; col. 3) comprising:

a pick-up resonant circuit (col. 3, lines 27-28) comprising a capacitive element (2, 5-7) and an inductive element (1) adapted to receive power from a magnetic field associated with a primary conductive path (not shown in figures) to supply a load;

a sensor (input to 11; col. 3, lines 37-41) configured to sense a condition of the load; and

a controller (11) configured to selectively tune or de-tune the pick-up in response to the load sensed by the sensor by varying the effective capacitance

of the capacitive element of the pick-up resonant circuit to control the transfer of power to the pick-up resonant circuit dependent on the sensed load condition (col. 3, lines 42-54).

Rydval further discloses a power supply comprising a resonant converter to provide AC to a primary conductive path of the ICPT (col. 1, lines 28-34).

With respect to claims 2 and 38, Rydval discloses the controller comprising a reactive element (5-7) and a switching device (8-10) configured to allow the reactive element to be selectively electrically connected to the pick-up resonant circuit.

With respect to claims 3 and 39, Boys discloses the apparent capacitance of the reactive element is varied to tune or detune the pick-up resonant circuit (col. 3, lines 42-54).

With respect to claim 4, Boys disclose the sensor senses the power required by the load (col. 3, lines 37-41).

6. Claims 1-4 and 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Boys (WO 01/18936; "Auckland").

With respect to claims 1 and 37, Rydval discloses an inductively coupled power transfer pick-up (fig 2; pages 7-8) comprising:

- a pick-up resonant circuit comprising a capacitive element (202) and an inductive element (W) adapted to receive power from a magnetic field associated with a primary conductive path (P) to supply a load;
- a sensor (208) configured to sense a condition of the load; and



a controller (207) configured to selectively tune or de-tune the pick-up resonant circuit in response to the load sensed by the sensor by varying the effective capacitance of the capacitive element of the pick-up resonant circuit to control the transfer of power to the pick-up dependent on the sensed load condition (abstract).

With respect to claims 2 and 38, Auckland discloses the controller comprising a reactive element (202) and a switching device (203) configured to allow the reactive element to be selectively electrically connected to the pick-up resonant circuit.

With respect to claims 3 and 39, Boys discloses the apparent capacitance of the reactive element is varied to tune or detune the pick-up resonant circuit (page 7, lines 15-18).

With respect to claim 4, Boys disclose the sensor senses the power required by the load (208).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6, 9-12, 21-23 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boys.

With respect to claim 6, Boys discloses the recited limitations, as discussed above in the rejection of claim 17. Boys further discloses that it is well known to design

the pick-up resonant circuit with an LC resonant circuit (col. 1, lines 21-24). One skilled in the art would recognize that an inductive element can be added to the inductance already present in the pick-up coil.

With respect to claims 9-11, Boys discloses the recited limitations, as discussed above in the rejections of claims 20-21.

With respect to claim 12, Boys discloses that the inductance of the winding is parallel to the tuning capacitor. One skilled in the art would readily understand the advantages of placing an inductor in series/parallel with the capacitor by calculating the resultant filter.

With respect to claim 21, it would be obvious to one skilled in the art that comparing the switching time relative to degrees of the sensed voltage phase is dependent on the frequency of the voltage. One skilled in the art would readily understand that increasing/decreasing the frequency of the voltage would allow the switching device to be activated during the time period of between 0 and 90 electrical degrees.

With respect to claims 22-23, it is well known in the art that capacitors placed in parallel can be replaced with one equivalent capacitor, whose capacitance equals the sum of all of the original capacitors.

With respect to claim 30, Boys discloses the inductively coupled power transfer pick-up is for vehicles. It would be obvious that the conductive path is beneath a substantially planar surface in order to allow the vehicle to travel.

With respect to claim 36, it would be obvious to one skilled in the art that it would be more efficient to replace a large capacitor with a super capacitor. The charge/discharge properties of super capacitors are well known, as is the fact that they take up less room for the same amount of capacitance.

9. Claims 13-15 and 24-25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boys in view of applicants' admitted prior art ("APA").

With respect to claims 13 and 24, Boys discloses a single switch. It is inherent that all capacitors have two terminals. APA discloses that the switching device can comprise one or two switches (page 8, lines 14-21). Boys and APA are analogous because they are from the same field of endeavor, namely ICPTs. At the time of the invention by applicants, it would have been obvious to replace two switches with one in order to reduce the number of parts in the circuit.

With respect to claims 14-15 and 25, Boys discloses semiconductor switches with anti-parallel diode connections (fig 7). At the time of the invention by applicants, it would have been obvious to apply these switches to the single switch of figure 6 (614), since it has been held that the rearranging of parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

10. Claims 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boys in view of applicants' admitted prior art ("APA").

Rydval discloses a single switch. It is inherent that all capacitors have two terminals. APA discloses that the switching device can comprise one or two switches (page 8, lines 14-21). Rydval and APA are analogous because they are from the same

field of endeavor, namely ICPTs. At the time of the invention by applicants, it would have been obvious to replace two switches with one in order to reduce the number of parts in the circuit.

Rydval further discloses the switch can be a transistor (col. 3, lines 31-32). It would have been obvious to one skilled in the art to select at least one of IGBTs, MOSFETs, and BJTs, since these are the most common types of transistors, and they are art recognized equivalents for their ability to complete a circuit connection based on a control signal.

### ***Conclusion***

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADI AMRANY whose telephone number is (571)272-0415. The examiner can normally be reached on Mon-Thurs, from 10am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford Barnie can be reached on (571) 272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

7-1-09

/Stephen W Jackson/  
Primary Examiner, Art Unit 2836